Tania R. Allard

RESEARCH SOFTWARE ENGINEER · DATA SCIENTIST

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Profile

Formerly Tania Sanchez Monroy. Eligible to work in the UK.

A passionate innovator with experience in bringing new technology to bear on complex research challenges. Skilled in data collection, processing, analysis and visualisation. Strong communication skills and able to present abstract concepts in an accessible way to all organisational levels. Passionate about open science, reproducibility, and diversity and inclusion in STEM areas. Sustainability and open source advocate and contributor.

Education

The University of Manchester   *Manchester, UK*

PHD IN MATERIALS SCIENCE / COMPUTATIONAL MODELLING   *Jan 2013 - Dec 2016*

Thesis: Modelling and characterisation of compliant and hydrated materials. Supervised by Prof. Brian Derby
- Developed algorithms and data analysis pipelines to model the behaviour of biological tissues in Python and R. Such algorithms reduced the computational time by 70% as well as the associated errors by 30% compared to the state of the art.
- Developed a sophisticated data acquisition and preservation strategy for real life data sets between 2 and 25GB size. These were posteriorly analysed using complex data analysis pipelines and classification algorithms in Python and R (numpy, pandas, scikit-learn, tidyverse).
- Interpreted complex simulation data using statistical methods implemented in R.
- Worked in a cross-disciplinary team to develop a unique multi-scale simulation technique and implemented the methodology to explain complex biological phenomena using own generated computational scripts and packages written in Python, FORTRAN, MATLAB and C++.

UNAM   *Mexico City, Mexico*

BENG IN MECHATRONICS ENGINEERING   *Aug 2016 - May 2011*

Topics covered include: multivariate calculus, statistics, linear algebra, robotics, automation and control, design, mechanics of solids, fluids mechanics, electronics. Major: computational modelling and medical devices

Relevant Experience

The Python Software Foundation   *UK/USA*

BLOGGER   *March 2018-present*
- Wrote blog posts for the Python Software Foundation main blog, reaching the worldwide Python community.

Freelance / consultant   *Manchester, UK*

DATA AND REPRODUCIBILITY CONSULTANT   *Nov 2016 - present*
- Consulted startups and researchers on reproducible data analysis workflows, open data, data modelling, and aided them to develop strategies to satisfy their data engineering needs. Reducing in most of the cases the computational times and optimised their data intensive workflows.
- Created and presented executive dashboards to show data insights using R Shiny apps, Plotly, and d3.js
- Mentored startups on large scale data and analytics using advanced statistical models.

The University of Sheffield   *Sheffield, UK*

RESEARCH SOFTWARE ENGINEER / MACHINE LEARNING TEAM MEMBER   *Nov 2016 - present*
- Main contributor to the European funded projects OpenDreamkit as well as to a number of open source projects, such as project Jupyter, GPy for Gaussian Processes, RopenSci, among others.
- Used RESTful web design using Flask, Jinja2, JQuery, JS and Django for the development of multiple web apps.
- Developed numerous data analysis pipelines, from wrangling to prediction and results dissemination, for research projects in Linguistics (Natural Language Processing), Bioinformatics (Classification and regression), Materials science (regression), and Geography (geolocation data analysis) using R and Python.
- Implemented the use of third parties API's and web scraping to collect raw data for posterior analysis and modelling.
- Trained and supervised junior colleagues and students, with a particular focus on reproducible workflows, software development best practices, High-Performance Computing, and open source projects.
- Worked in policy creation at both, a national and international level as member of the UK Research Software Engineering and NUMFocus Diversity and Inclusion in Scientific Computing committees.
- Developed interactive dashboards and data visualizations using d3.js, Shiny, Bokeh, and Plotly to disseminate project findings.
- Developed tools to support reproducible research and literate programming.

NHS, Manchester business school
CONSULTANCY FELLOW

Manchester, UK

February - October 2016

- Liaised with multiple stakeholders, from high-level directors to patients within the NHS to identify organisational needs.
- Led data collection initiative and performed the statistical analysis of the collected data. This allowed to assess the efficacy of the Healthier Together programme and predict both desired and undesired outcomes of resources reallocation.
- Developed a framework for specialist hospitals within the Greater Manchester area to improve the sharing of institutional knowledge, improving efficiency of communication, and eliminating 50% of unnecessary meetings.

University of Southern California, MEMS
ENGINEERING INTERN

California, USA

2011

- Performed real-time data collection and analysis for implantable drug delivery devices. The implemented models allowed for 20% increase in dose tracking and fault detection accuracy.
- Architected and implemented analytics and visualization components for a device data analysis platform to predict potential hardware failures.

Skills

Experienced open source developer with a specialization in scientific computing, including visualization, data analysis, and practical machine learning.

Programming languages	Python, R, C/C++, MATLAB, Fortran, Unix / Linux shell (bash) , Julia
Web technologies	HTML, css/sass, Flask, jQuery, Jinja, Django, JavaScript
Data science and data analysis	R, Sickit-learn (Python), SciPy, Pandas, Numpy, Spark
Software engineering	git, Heroku, code review, profiling and optimisation, APIs, Docker, Travis CI
Productivity tools	LaTeX, IPython, Jupyter notebooks , R markdown
Machine learning	Linear/logistic regression, Clustering, k-NN, Random Forests, PCA, NLP, Decision trees
Visualisation and reporting	D3.js, Bokeh, Seaborn / Matplotlib, Plotly, Shiny, ggplot, Dash, vega-lite
Cloud solutions	Microsoft Azure, Amazon Web Services
CAD/ CAM/ FEA	Abaqus, Ansys, CATIA, SolidWorks
Engineering / mathematical software	LabView, SIMULINK, MATLAB (incl. optimisation toolbox), Mathematica
Languages	Spanish (mother), English (proficient), French (intermediate)

Professional activities

PyCon Charlas chair, PyCon US	2018
Assessment group member, DISC NUMFOCUS	2018
Mentor, Hackmed and HackSheffield	2018
Maintainer, Software Carpentry Python Ecology Lesson	2018
ELife ambassador, ELife Innovation	2018
Open source / working in the open mentor, Mozilla Open Leaders	2018
Core committee member; Surveys and community, RForwards	2017-18
Diversity chair, Juliacon	2017-18
Reviewer, ReScience	2017-18
Reviewer, Journal of Open Source Software (JOSS)	2017-18
Elected member, UK Research software engineering committee	2017-18
Data scholar, Data study workshop: Alan Turing Institute	2017
Diversity and equality chair, Talks co-chair, 2nd Research Software Engineering Conference	2017
Diversity and equality committee member, Computer Science, University of Sheffield	2016-18
Lead Python Instructor: Manchester and Sheffield, Code First Girls	2017-18
Talks co-chair, 2nd Research Software Engineering Conference	2017
Supporting organiser, Nanoprinting conference	2016
Cultural affair officer, Manchester Mexican Society	2015
Cultural affairs officer, Mexican Society in the UK	2014
Volunteer, Manchester Girl Geeks, The British Science Association, Coding Dojo	2013-17

Talks and workshops

Feb 2018	**Her + data**, The importance of community in the use of data	*Manchester, UK*
Oct 2017	**Manchester R user group**, What has reproducibility ever done for us?	*Manchester, UK*
Sep 2017	**RSE conference**, Workshop: Reproducible data analysis using Jupyter notebooks	*Manchester, UK*
Jun 2017	**Machine Learning retreat**, Reproducible ML workflows	*Sheffield, UK*
Apr 2017	**Nanobruecken** , Characterisation of thin hydrated films	*Germany*
Dec 2015	**MRS Fall** , Viscoelastic and poroelastic charcterisation and modelling of thin films	*Boston, USA*
Jun 2015	**Biomaterials showcase**, Modelling the mechanical properties of compliant and hydrated films	*MAnchester, UK*
Apr 2015	**Nanobruecken** , Modelling the viscoelastic properties of PDMS	*Germany*
Jan 2015	**Winter School, UNAM Engineering faculty**, Nanomecanica de materials biologicos (invited talk)	*Mexico*
Jun 2013	**Wrigtington Gold Medal**, Optimised pre-operative planning for elbow arthrolysis	*Wigan, UK*

Honors & Awards

Diversity scholarship: speakers, PyCon US 2018
Outstanding mentor, University of Sheffield 2017-2018
Fellowship, Software Sustainability Institute 2017
Diversity scholarship, Diversity in Scientific Computing, NUMFocus 2017
Recognition award: staff, University of Sheffield 2017
1st prize: student talk, Hysitron meeting 2017
2nd place: Social venture, Venture further business competition 2016
1st place, venture further business competition 2015
1st place: postgraduate presentation, Writington gold medal 2013
CONACYT/Manchester scholar, University of Manchester 2013-16
Academic excellence scholarship, SEP 2013-2016
USC Viterbi: Engineering scholarship, University of Southern California 2011
Academic excellence scholarship, UNAM-SEP 2008-11

Mentoring

University of Sheffield   *Sheffield, UK*
PHD STUDENTS MENTOR   *September 2017 - present*
- Provided mentorship and guidance for PhD students completing their graduate studies.
- Was awarded the distinction of outstanding mentor: (`https://www.sheffield.ac.uk/rs/ecr/mentoring/dotm`).

Mozilla Open Leaders Mentor   *USA, UK*
MOZILLA FOUNDATION   *February 2017 - present*
- Invited to act as a mentor during Round 5 of Mozilla's Open Leadership Training.
- Meeting with assigned project lead to provide insight and support with their OSS projects.
- Gained valuable coaching skills and connections across the Mozilla and open source community.

Technical mentor   *Sheffield, UK*
HACKMED AND HACKSHEFFIELD   *January 2017 - present*
- Acted as technical mentor during the events, providing guidance and expertise to the teams competing.
- Was involved in the organisation, advertising, and logistics of the events.

Teaching and lesson development

Maintainer of the Software Carpentry Python ecology lesson, Software Carpentry
Contributor to the Python and Instructor training lessons, Software Carpentry
Taught multiple carpentries and instructor trainings, Software Carpentry
Lead Instructor and curriculum developer Advanced Python, CodeFirst:Girls
Reproducible science and data management, Out of Our Minds: Leverhulme Trust Fellowship
Reproducible science, University of Sheffield: PhD students development
Web data in Python, Research Methods Institute, University of Sheffield
Python, Git and R for linguists, School of humanities, University of Sheffield
Computational nanomechanics: winter school, Faculty of Engineering, UNAM
Teaching assistant: School of materials, University of Manchester

Additional projects

Open NASA   *USA / UK*
NASA DATANAUT   *Sept 2017 - present*
- Organised community events focused on the analysis and visualization of Open NASA data sets.
- Worked on the identification and development of effective visualization tools for multiple dictionaries.
- Currently working on the development of Python libraries to access some NASA APIs.

Mozilla Foundation   *USA, UK*
MOZILLA OPEN LEADERS: CODING FOUNDATION   *Sept 2017 - present*
- Founder of Coding Foundation, a programme aimed to support and encourage the inclusion and retention of women and members of the LGBTQ community in computer science and tech related undergraduate courses all around the world.
- Selected for Round 4 of Mozilla's Open Leadership program where I received training and developed skills in open leadership, project management, building communities, open communications and running awesome events.
- The project is in current development as part of a wider strategy within Yorkshire to increase fair representation in undergraduate courses.